METHOD AND SYSTEM FOR DOSE CONTROL DURING AN ION IMPLANTATION PROCESS

ABSTRACT OF THE DISCLOSURE

A method is presented for compensating for the effects of charge neutralization in calculating the 'true' ion dose, i.e., the dose assuming no changes of charge state of ions during an implantation process. An ion beam is generated under normal operating conditions, e.g., stable vacuum exists, and no target is being implanted. At least one additional detector would be positioned in the target chamber, and a dose measurement conducted simultaneously with a measurement of the beam current with the Faraday, which is located outside of the charge neutralization region, to establish a reference ratio. A wafer is then placed at the target location, and simultaneous measurements made with the additional detector and Faraday, as before, to determine the ratio between the beam current and the detector during wafer implantation. Any drift from the reference ratio indicates the dose error due to charge neutralization from wafer outgassing during implantation. Software for controlling various parameters could be configured to use the ratio drift data to change the dose counter to compensate for the dose error due to charge neutralization.